INTRODUCTION

Over the years the indications for CD (cesarean delivery) have widened from saving either the mothers or infants life or both to prevent immediate complications and contributed to high increasing rates of CD in many countries. Current nation wide rates in developed countries vary between 12-33%. The cesarean section rate (CSR) has increased in USA from 20.7% in 1996 to 29.1% in 2004 and in Wales and England from 16% in 1995 to 21.5% in 2000. The trend is similar in less developed countries. Repeat cesarean section rate is number of repeat cesareans per 100 live births. Repeat cesarean section rate is increased from 11-13% between 1996 and 2002. Decline in vaginal birth after cesarean (VBAC) is also a contributing factor for increasing repeat CSR. In South Australia, VBAC rates decreased from 30.4% in 1998 to 19.7% in 2003. These rising rates of primary and repeat cesareans are responsible for increasing proportion of pregnant women with complications of prior CS.

One of the major concern relating to previous cesarean delivery (PCD) is the potential of severe adverse effects on future pregnancies. Abnormal placentation like morbid adherence of placenta (placenta accreta or percreta) is a rare but serious complication of placentation among women with PCD and anterior placenta praevia. The overall incidence of severe placenta accreta (defined as resulting in death, hysterectomy, blood transfusion, coagulopathy or being associated with placenta percreta) was estimated as 0.05% and the odd ratio (OR) for women with repeated CD is 3.3%. A meta analysis of observational studies concluded that women with one or more PCD had a 2.7 fold risk (95% CI 2.3-3.2) of placenta praevia in a subsequent pregnancy. Risk of peripartum hysterectomy due to abnormal placentation and peripartum infection in scarred uterus is also very high. There is evidence that previous cesarean delivery cohort has increased risk for preterm birth (< 37 weeks) as well as very preterm birth (< 32 weeks) and, of being small for gestational age (birth weight < 10th percentile for gestational age). An increasing proportion of population booking for antenatal care has had a PCD. These women are at increased risk of complications compared to women with previous vaginal delivery (PVD). The aim of this

ABSTRACT

Objective: To determine selected maternal and neonatal adverse outcomes at repeat cesarean delivery compared with repeat vaginal delivery.

Study Design: Cross-sectional study.

Place and Duration of Study: Lyari General Hospital, Karachi, from January 2005 to December 2008.

Methodology: Healthy pregnant women at 28-42 weeks of second singleton pregnancy were selected for study. Those with previous cesarean birth was labelled the exposed group and those with previous vaginal birth were considered the control group. Maternal and neonatal morbidity's attributable to the previous cesarean section was estimated. Potential confounders like persistent medical disorders, previous adverse outcome and trial of scar cases was excluded. Results were presented in frequency and percentage. Effects of outcomes were calculated as odds ratio with 95% confidence interval. SPSS-16 was used for statistical data analysis.

Results: A total of 195 mothers at repeat cesarean delivery were compared with 1486 mothers at repeat vaginal delivery. Mothers with previous cesarean birth were at high risk of peripartum hysterectomy and placenta accrete followed by placenta praevia [OR 7.6 (95% CI = 0.48-122.8), 7.6 (0.48-122.8) and 2.5 (0.68-9.6) respectively]. Very preterm birth [OR = 3.86, 95% CI 1.15-12.97] was the most significant neonatal adverse outcome.

Conclusion: Cesarean section in first pregnancy conferred an additional risk in the second pregnancy even after exclusion of known complications of trial of scar. These should be part of overall clinical assessment at the time of first cesarean section.

Key words: Cesarean delivery. Vaginal delivery. Adverse outcome. Placenta accreta. Preterm birth.

ORIGINAL ARTICLE

Maternal and Neonatal Adverse Outcome at Repeat Cesarean Delivery Versus Repeat Vaginal Delivery

Shakira Perveen

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One of the major concern relating to previous cesarean delivery (PCD) is the potential of severe adverse effects on future pregnancies. Abnormal placentation like morbid adherence of placenta (placenta accreta or percreta) is a rare but serious complication of placentation among women with PCD and anterior placenta praevia. The overall incidence of severe placenta accreta (defined as resulting in death, hysterectomy, blood transfusion, coagulopathy or being associated with placenta percreta) was estimated as 0.05% and the odd ratio (OR) for women with repeated CD is 3.3%. A meta analysis of observational studies concluded that women with one or more PCD had a 2.7 fold risk (95% CI 2.3-3.2) of placenta praevia in a subsequent pregnancy. Risk of peripartum hysterectomy due to abnormal placentation and peripartum infection in scarred uterus is also very high. There is evidence that previous cesarean delivery cohort has increased risk for preterm birth (< 37 weeks) as well as very preterm birth (< 32 weeks) and, of being small for gestational age (birth weight < 10th percentile for gestational age). An increasing proportion of population booking for antenatal care has had a PCD. These women are at increased risk of complications compared to women with previous vaginal delivery (PVD). The aim of this
study was to find out some selected maternal and neonatal adverse outcomes at repeat CD versus those with repeat vaginal delivery.

**METHODOLOGY**

This cross-sectional study carried out at Lyari General Hospital, Karachi, from January 2005 to December 2008. Approval from Ethical and Research Committee of the Institute was taken. Healthy subjects with previous one birth at 28-42 weeks of singleton pregnancy were selected for study. Those with previous one cesarean section formed the exposed group and those with previous one vaginal birth formed the control group. All cases of repeat elective and emergency CS without labour were included for study. Cases of persistent problems like Diabetes mellitus, hypertension and previous adverse outcome like preterm birth, placental problems and trial of scar excluded. These problems were assumed to be reason for a CD or instrumental delivery in the first birth which might contribute to problems in the second birth as well. Outcome variables selected for mothers were anteparum hemorrhage, placenta praevia, placenta abruption, placenta accreta (one code used for placenta accreta, increta and percreta) and peripartum hysterectomy. Outcome variables selected for infants are very preterm birth (< 32 weeks), preterm birth (< 37 weeks) and birth weight < 2500 gms. Results were compiled in frequency and percentage. Chi-square test was used to check the significance of outcome variable with age, gestational age and birth weight. P-value of < 0.05 was considered significant. Effects of outcomes were presented as OR (odds ratio) with 95% CI on SPSS-16. OR was the measure of the odds (or chances) that a case was exposed to the risk factor (CS) to the odds that a control was exposed to the risk factor.

**RESULTS**

During the study period there were 4428 deliveries. 1012 were cesarean deliveries and 3416 were vaginal deliveries. CSR was 22.8%. Primary cesarean sections (CS) were 340 (33.5%) and primary vaginal births were 1650 (48.3%). Out of them repeat CS cases were 195 (57.3%) and repeat vaginal birth cases were 1486 (90.06%). Of the 1681 women with data on both first and second births, 195 (11.6%) had a CS in their first pregnancy, repeat CDR was 11.6%. Compared with previous vaginal birth mothers, these mothers tended to be older. Their infants were preterm (Table I). At their second birth, out of 195 mothers with PCD, 15 (7.6%) experienced one or more selected adverse outcome compared with 60 (4.0%) mothers of PVD. Significant OR was observed for placenta accreta and peripartum hysterectomy. A total of 22 (11.2%) infants of CD group had one or more of the three selected adverse outcomes as compared with 110 (7.4%) newborns of the vaginal birth group. The most significant neonatal adverse outcome was very preterm birth (Table II).

None of mothers died but one mother in the PCD group suffered severe morbidity due to secondary postpartum hemorrhage, peripartum hysterectomy and massive transfusion required. Two neonates of PCD cohort died due to severe prematurity.

**DISCUSSION**

The primary concern in birth emergencies is the mother and the current fetus. The high rate of CD in many countries and the opinion that consider CD to be an equal option, indicate that in most cases, other consideration are valid. It was found primary CS (compared with vaginal birth) conferred an additional risk of complications in the second pregnancy for both mother and fetus, and substantial proportion of complications was attributable to primary CS. Morbidity arising from previous CS has used elective or emergency repeat CS without labour as the point of comparison. To reduce bias confounding by indication (healthy women taken), previous adverse outcomes and cases of trial of scar excluded. In the study CDR (22.8%) was high and comparable with two other local studies. In Northern Greece CDR was very high (35.5%) and in Norway it is low.
(16.4%).\textsuperscript{19} RCDR (11.6%) is also comparable with overall RCDR in USA.\textsuperscript{7} An important finding of this study is high CD and RCDR. More than 20 years ago WHO recommended that CDR should not be higher than 15%.\textsuperscript{20} Even though the demographic changes that have occurred since then, particularly the increasing maternal age, suggest that a target rate of 20% might be more realistic now a days. These high rates of primary and repeat CD are warnings for clinicians facing problems in repeat deliveries.

With increasing rates of CD, knowledge of the possible adverse outcomes in later pregnancies is needed to enable informed decision making by women and professionals. The present results are in line with the literature regarding risk of placental problems (placenta praevia, placental abruption) associated with previous CD.\textsuperscript{1,12,14,21} Odd ratio (OR) for placental problems at second birth in previous CD cases is around 2 in study by Hemminki \textit{et al.},\textsuperscript{1} and < 2 in study by Daltveit \textit{et al.}\textsuperscript{12} Placenta accreta, a serious and markedly adverse outcome was observed frequently in the study. Incidence of placenta accreta in a recent local study was 16.6% after one CD and 30% after four CDs.\textsuperscript{22} The reported incidence of placenta accreta is 5% in unscarred uterus, 24% in previous one CS uterus and 40% in previous 2-3 CS cases.\textsuperscript{23} Placenta accreta is the cause of significant morbidity like peripartum hysterectomy, massive blood transfusion and coagulopathy as seen in this as well as other studies.\textsuperscript{13,15}

Risk of placenta praevia is also one of the adverse outcome observed in this study. One study found relative risk of placenta praevia as 4.5 after one CS and 44.9 after 4 or more CS.\textsuperscript{24} A comparative study found risk of preterm birth is 58% in previous CD and 5% in previous VD cases.\textsuperscript{15} An adverse neonatal outcome in this study was seen in 11.2% of live born of CD cohort and 7.4% of vaginal delivery cohort. In another study 13.3% cases of CD and 12.4% of vaginal delivery cohort had adverse outcome with very high risk for preterm birth.\textsuperscript{15} Preterm birth is a major cause of perinatal death worldwide and around 28% of neonatal deaths are attributed to preterm birth.\textsuperscript{25} If a previous CD creates suboptimal placental implantation and thereby suboptimal placentation functioning, an adverse effect in terms of lower birth weight or shorter gestational age can be expected.

Limitations of this study are the observational nature, residual confounding (booking status, infection in previous CD, the time elapsed since exposure) and small scope of outcomes.

\textbf{CONCLUSION}

Maternal and neonatal risks are increased with CD at next birth. These risks are part of overall clinical assessment at the time of first birth. A careful decision of an elective primary CD in low risk population, for its adverse impact on future birth is therefore important. Large scale population-based study is recommended to validate the present findings.

\textbf{REFERENCES}


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